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H. S. DUNN
WINDOW SHIELD

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2 Sheets-Sheet 1

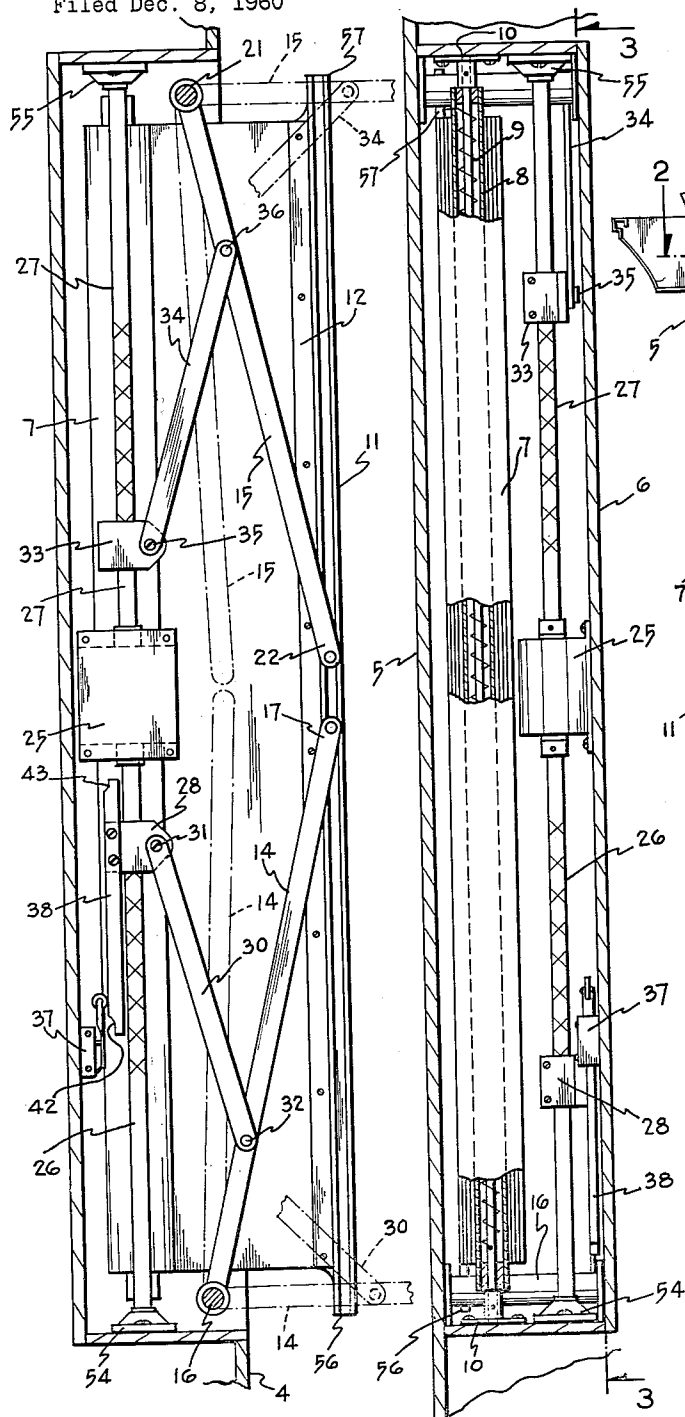


FIG. 1

FIG. 3

FIG. 2

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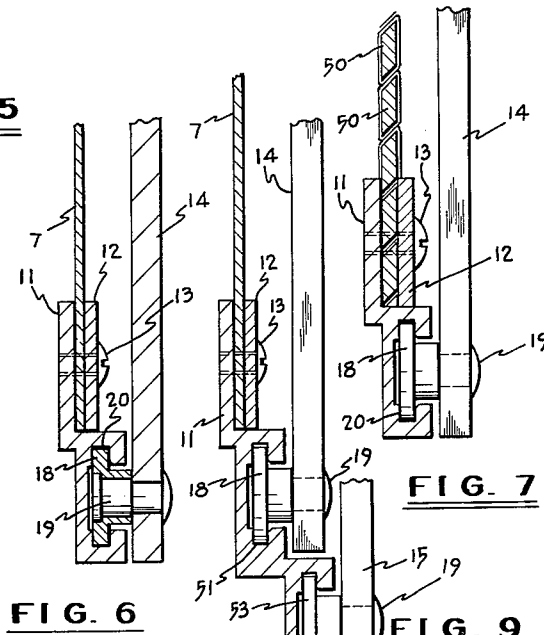
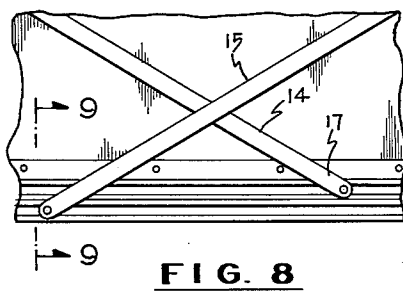
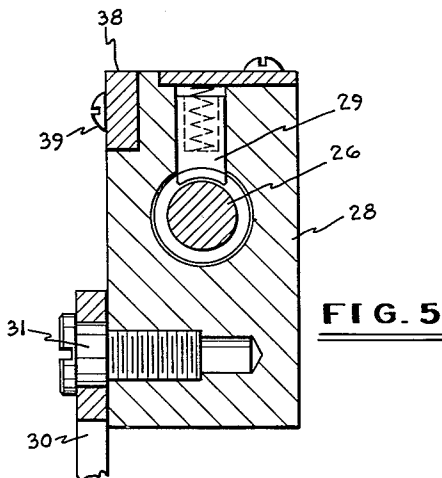
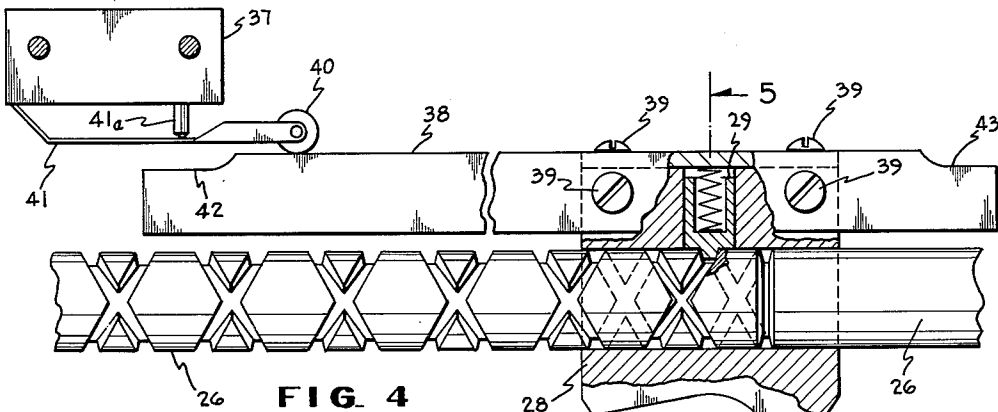
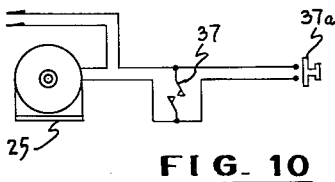


FIG. 7

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3,074,474

WINDOW SHIELD

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This invention relates to window screens or eaves drops and particularly to a type of protective curtain or screen capable of being dropped or drawn down vertically or angularly from the eaves of a dwelling or other building to protect a window or other opening therein from sunlight, rain and wind and to provide privacy for the occupants of the building.

At the present time many homes, and particularly those located in the South, are provided with relatively wide overhang for the roofs in order to provide increased protection for large windows and glass doors now extensively used. Air conditioning is being widely used and the glassed-in areas of the houses permit the penetration of heat and thus materially increase the cost of operation of the air conditioners. It has been proposed to use canvas hanging drops often suspended forwardly of the windows. However, such drops are secured only at the top and they sway with the wind, often striking against windows and other parts of the buildings and causing damage thereto and sometimes to passing pedestrians.

In many parts of the country and particularly in the South, so-called "awning" shutters are used, and while such devices are effective to a certain degree, the leading edges of the shutters are never low enough to afford protection against the late afternoon sun.

It is therefore one of the objects of the present invention to provide a protective screen or shield which, when not in use, can be raised to a housed position and which, when lowered, can be extended vertically or angularly downward and forwardly of a window or other building opening and possibly several feet outwardly therefrom, and which, when in its extended or operative position, can terminate at such a distance from the roof as to provide the required protection from sunlight, wind and rain while affording privacy to the occupants of the building to which it is fitted.

It is an object of the invention to provide a device of this kind in which the operation can be motor-controlled; in which the curtain or screen will be held against flapping or swinging in the wind and with which a positive lowering and raising movement of the curtain will be always effected.

With these and other objects to be hereinafter set forth in view, I have devised the arrangement of parts to be described and more particularly pointed out in the claims appended hereto.

In the accompanying drawing, wherein an illustrative embodiment of the invention is disclosed,

FIG. 1 is a vertical sectional view through a portion of a building, with the improved screen or eaves drop mounted thereon and with the curtain disposed in its lowered position;

FIG. 2 is an enlarged sectional view, taken substantially on the line 2—2 of FIG. 1, looking in the direction of the arrows;

FIG. 3 is a sectional view, taken on the line 3—3 of FIG. 2, looking in the direction of the arrows;

FIG. 4 is an enlarged view, with certain parts broken away and in section, of a portion of FIG. 3 showing parts of one of the reverse-grooved rods, the traveller thereon, and the switch means for controlling the operation of the motor;

FIG. 5 is a sectional view, taken substantially on the line 5—5 of FIG. 4, looking in the direction of the arrows;

FIG. 6 is an enlarged vertical sectional view through

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the lower bar of the screen, showing the connection of one of the pivoted arms thereto;

FIG. 7 is a view similar to FIG. 6, but showing the screen or curtain as being composed of a plurality of flexibly-connected slats;

FIG. 8 is a face view of the inner face of a fragmentary portion of the curtain or screen, with a slightly modified arrangement of the pivoted arms, wherein these arms cross one another;

FIG. 9 is an enlarged sectional view, taken substantially on the line 9—9 of FIG. 8, looking in the direction of the arrows; and

FIG. 10 shows the electrical circuit for the operating motor.

Referring to FIG. 1, there is therein shown a portion of a building, 1 indicating a part of one of the walls in which a window 2 is provided. The roof is shown at 3 and the same is provided with the conventional overhang forming an eave having a soffit 4 and a fascia board 5.

The improved window screen or eaves drop and its operating elements are housed within an elongated, open-bottom box or housing 6 mounted in the eave behind the fascia board 5. The housing box 6 can be composed of wood or metal and if it cannot be conveniently located in the eave behind the fascia board, it can be added to the building structure by securement to the outer edge of the soffit or otherwise suitably mounted in place.

The window screen or eaves drop includes a flexible member or curtain 7 mounted upon a spring roller 8 rotative in brackets 10 provided on the opposite end walls of the housing 6, the spring 9 of the roller biasing the curtain toward raised or rolled-up position so that there is always a constant tendency of the screen or curtain to assume a raised or inoperative position and become located within the housing box 6.

Secured to the lower end of the curtain 7 for the full width of the same is a bar 11 which may be composed of metal such as aluminum, said bar 11 being reinforced by an overlying strip 12, the lower end portion of the curtain or screen being sandwiched between the bar 11 and the strip 12 and secured thereto by means of the screws 13 or equivalent fastening means. The means for unrolling the curtain and extending it to its lowered or operative position as shown in FIG. 1, includes a pair of arms indicated respectively at 14 and 15. The arm 14 has one end pivoted on a cross shaft 16 extending between the front and rear walls of the housing box 6, and its other end 17 connected to the bar 11. The connection between the end 17 of the arm 14 and the bar 11 is established by means of a roller 18 (FIG. 6) rotatably mounted on a pin 19 secured in the end of the arm 14, which roller is guided in an undercut groove 20 provided in and extending for the length of the bar 11.

The arm 15 has one end pivoted on a shaft 21 extending between the front and rear walls of the housing box 6 at an end thereof remote from the end of the housing box in which the shaft 16 is located, and the second end 22 of the arm 15 is provided with a roller guided in the groove 20 in the manner described in connection with the arm 14. It will be apparent from the foregoing, that when the two arms 14 and 15 are pivotally swung downwardly, they will cause unrolling of the screen or curtain and will lower it to an extent permitted by the length of the arms 14 and 15. These arms 14 and 15 may be trussed or otherwise reinforced as indicated at 24 in FIG. 1 or they may be suitably shaped in any required way for strength and rigidity.

The means for causing pivotal movement of the arms 14 and 15 includes an electric motor 25, which is preferably of a size to enable it to be housed centrally within the housing box 6 and mounted on one of the walls there-

of. One end of the motor shaft is coupled to a reverse-threaded rod 26, while the other end of the motor shaft connects to a similar reverse-threaded rod 27. One end of the rod 26 is rotatably supported in a bearing 54 mounted on one end wall of the housing box 6. Similarly, one end of the rod 27 is rotatably mounted in a bearing 55.

Mounted for back and forth movement on the reverse-spiral threads of the rod 26 is a travelling block 28 (FIG. 5) provided with a spring-pressed stud 29 shaped for engagement with the reverse threads on rod 26. This arrangement is such that when the rod 26 is rotated by operation of the motor 25, the travelling block 28 will be moved back or forth as required to either cause lowering of the screen or curtain 7 or to cause its upward movement or retraction. Connection between the travelling block 28 and the arm 14 is established by means of a link 30 having one end pivoted on a pin 31 secured in the block 28 and its other end pivotally attached at 32 to the arm 14.

Operating along the reverse-threaded rod 27 is a travelling block 33, constructed similarly in most respects to the block 28, and the block 33 has one end of a link 34 pivotally attached to it as shown at 35, the opposite end of the link being pivoted to the arm 15 as shown at 36.

The operation of the motor 25 is controlled by a switch 37 which is provided at 37a with a remotely-positioned push button, and from the description of the mechanism thus far given, it will be apparent that when the switch 37 is closed, the motor 25 will be set in operation, and as the travelling blocks 28 and 33 are moved apart or in a direction away from the motor, they will cause the arms 14 and 15 to be pivoted downwardly and in the curtain 7 to be unrolled from its roller and thus lowered to the extent permitted by the length of the arms 14 and 15.

Carried by the block 28 is a switch bar 38 secured in the block by the screws 39. A roller 40 rotatively mounted at the end of a switch arm 41 rides on the switch bar 38, and for the greater portion of the length of the bar 38 the roller is held elevated against the switch button 41a to thereby maintain the switch 37 closed after it has been closed by pressure imposed on the push button 37a. At its opposite ends, the switch bar 38 is provided with notches shown respectively at 42 and 43.

When the travelling block 28 reaches the end of its travel in a direction toward the motor 25, and the curtain 7 has ascended and has been rolled up on its roller, the switch bar 38 will have reached a point where the notch 42 is at the roller 40 and the roller 40 has dropped down into the notch causing opening of the switch 37, thus stopping the motor 25 and halting further raising movement of the curtain. Similarly, in the descending or lowering movement of the curtain, when the travelling block 28 reaches the limit of its movement in a direction away from the motor and the curtain reaches the limit of its lowering movement, the motor will be stopped by the roller 40 dropping into the notch 43 in the switch bar, thus halting any further descent of the curtain.

From the foregoing, the operation of the improved wind screen or eaves drop will be readily understood. When the screen or curtain 7 and its operating elements, including the arms 14 and 15 and associated parts are in the raised position, all of these elements will be housed in the housing box 6 and covered and protected thereby. When it is desired to lower the curtain or screen, the switch 37 is manually closed by operation of the push button 37a and the motor 25 is thus set in operation. This causes the rotative movement of the reverse-threaded rods 26 and 27 and the travelling blocks 28 and 33 will move in a direction away from one another, causing downward-pivotal movement of the arms 14 and 15 and hence a lowering movement of the curtain to the limits of the downward swing of the arms. When the curtain reaches the limit of its downward movement, the switch rod 38 will have reached a position where the switch roller has

dropped into the notch 43 thus opening the switch 37 and halting the lowering movement of the curtain. The curtain will then remain in lowered protective position until it is desired to raise it. In the lowered position of the curtain, the arms 14 and 15 will act as rigid downward extensions from the housings and will prevent the curtain from swinging or flapping while also restraining it from rolling up on its roller.

When the curtain is to be raised, manual pressure on the push button 37a will close switch 37 and start the operation of the motor 25. At this time the travelling blocks 28 and 33 are at the end of travel in one of the spiral grooves in each of the rods 26 and 27 so that when the motor begins to rotate these rods a reverse movement of the travellers in the reverse grooves of the rods takes place and the curtain will be raised, the spring 9 rolling the curtain up on its rod 9 as the bar 11 is lifted by the upward pivotal swing of the arms 14 and 15.

The ends 56 and 57 of the bar 11 protrude slightly beyond the side edges of the curtain as seen in FIG. 3, which ends 56 and 57 contact with the hubs of the arms 14 and 15 on the raising movement of the curtain and form stop limits which restrict the upward movement of the bar 11.

While I have herein suggested that the curtain 7 may be composed of canvas or other suitable sheet material, it may be otherwise constructed. For example, in FIG. 7 the curtain is shown as being composed of a plurality of flexibly-connected slats or strips 50 and any suitable flexible, protective material capable of being rolled up can be used. Hence when herein referring to the screen as a "curtain" I wish to be understood as meaning any flexible material which can be rolled up and lowered as herein described and which will satisfactorily perform the functions required of this apparatus.

While I have herein shown the gearing in the form of reversely threaded rods and travellers mounted thereon for effecting the raising and lowering of the curtain, other forms of gearing may be availed of to impart the required pivotal movements to the arms 14 and 15 to cause the curtain to be resultantly raised and lowered.

It will also be noted that in the embodiment of the invention shown in FIGS. 1, 2 and 3, the end portions 17 and 22 of the respective arms 14 and 15 are so connected that they do not, in the raised position of the curtain, tend to overlap one another. This is possible in the case of relatively wide curtains. In a case where a relatively narrow curtain is used or where a curtain of greater length is required, the arms 14 and 15 can be arranged to overlap or cross one another as shown in FIGS. 8 and 9. In this embodiment, the end 17 of the arm 14 has its roller 18 engaged in an upper groove 51 in the bar 11, while a lower groove 52 provided in the bar and offset relatively to the groove 51, receives the roller 53 carried at the end of the arm 15.

While I have shown the curtain arranged to be halted at the end of its raising and lowering movements, it can be so arranged as to halt at intermediate points thus providing protection to any extent desired. Also, while the curtain is so mounted as to be raised and lowered vertically, it can be arranged for angular extension and retraction.

These and other modifications are considered as being within the scope of the invention and the claims appended hereto.

What I claim is:

1. A screen assembly for use on a building having a vertical window or the like comprising a downwardly opening housing, a curtain-and-roller assembly journaled in said housing and extending substantially the length thereof, said assembly including a flexible curtain fixed at one end to a roller biased for rotation about its longitudinal axis to normally maintain said curtain in a rolled-up condition, said curtain including opposed parallel side margins, said curtain including a rigid bar extending sub-

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stantially the width thereof and fixed on the other end of said curtain, said bar including lateral groove means extending substantially the length thereof, a pair of elongated, one-piece arms pivotally connected at one end on transverse axes of rotation on said housing outwardly of side margins of said curtain, the other ends of said arms being pivotally connected to said bar at said groove means and retained in said groove means for longitudinal movement therealong for substantially one-half the length thereof, a power shaft means journaled in said housing parallel to said roller, said shaft including reversely threaded portions along opposite end portions thereof, traveler elements engaged on said threaded portions and movable therealong in opposite directions in response to rotation of said shaft, one-piece links pivotally connected respectively to said traveler elements and intermediate portions of the respective arms for extending said arms from a substantially terminally aligned position when the curtain is rolled up to an extended position wherein the arms are disposed outwardly of the side margins of said curtain, and power means connected to said shaft for rotating said power shaft means about its longitudinal axis.

2. The structure of claim 1 wherein one of said travelers includes an elongated switch member thereon and disposed parallel to the path of travel of said one traveler, said switch member including control portions longitu-

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dinally spaced therealong, and a control switch fixed to said housing and including a control arm biased toward said switch member and normally closed thereby and extendable into said control portions for opening said switch.

3. The structure of claim 1 in which said groove means comprises a pair of overlying parallel grooves extending along the length of said bar, said arms being disposable in overlapped relationship when positioned within said housing.

4. The structure of claim 1 wherein said power means comprises a reversible motor connected intermediately of said power shaft means whereby torque on said power shaft means is substantially equalized.

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